www.wvara.org

November 2023

The Heterodyne

Newsletter of the West Valley Amateur Radio Association

November Meeting at the American Red Cross
(NOT ACCESSIBLE VIA ZOOM)

Wednesday, November 8
Meeting Starts at 7pm
Visitors Are Welcome!

Meeting Location:
American Red Cross,
Silicon Valley Chapter
2731 N First Street at Plumeria Dr
(southwest corner) in San Jose

WVARA Repeaters (W6PIY)		
Band	**Frequency**	**PL**
6 Meters	52.580- MHz	151.4 Hz
2 Meters	147.39+ MHz	151.4 Hz
1.25 Meters	223.96- MHz	156.7 Hz
0.70 Meter	441.35+ MHz	88.5 Hz
0.23 Meter	1286.2- MHz	100 Hz

WVARA's club net is on the W6PIY repeaters each Tuesday at 8:30 pm. All repeaters are linked together during the net. The net control script can be found at www.wvara.org in the "On The Air" dropdown.

This month's WVARA meeting will be held in-person on Wednesday, November 8, in MeetingRoom 3 at the Silicon Valley Chapter of the American Red Cross, 2731 N. First Street at PlumeriaDrive (southwest corner) in San Jose. Social time begins around 6:45pm with the meeting beginning at 7pm. If you haven't been to the Red Cross in a while, "talk-in" is usually available onthe Association's repeaters. Best choice would be 2m/220.

Ed Fong, WB6IQN, will bring us up to speed on a central part of all modern radios — the phase-lock loop (PLL). PLLs are used everywhere. Not only in our transceivers, but cell phones,televisions, computers, etc. We could not live without them. PLL's where not practical until theinvention of the modern day integrated circuit which allowed thousands of transistors on a singlechip. Prior to the PLL,

Ed Fong, WB6IQN

we used single crystals for VHF FM. This was very expensive and most ofus could only afford a few channels.

Ed will explain how PLL's work in a non mathematical presentation. He will explain where phase noise originates and techniques engineers have used minimize it. Ed will bring his HP 8591 spectrum analyzer and compare the phase noise of various HT's to a crystal control radio. Bring your HT and see how yours performs against a crystal control radio. Ed is an enthusiastic speaker and is guaranteed to both enlighten and enliven with his presentation.

Ed Fong was first licensed in 1968 as WN6IQN. He later upgraded to Extra Class (when 20 WPM was required) with his present call of WB6IQN. He obtained the BSEE and MSEE degrees from the Univ. of California at Berkeley and his Ph.D. from the Univ. of San Francisco. A Life Senior Member of the IEEE, he has 12 patents and over 40 published papers and books in the area of communications and integrated circuit design. Presently, he is employed by the University of California, Santa Cruz (previously with Berkeley from 1997-2010) as an instructor teaching graduate classes in Antenna Design, RF design and high speed interface. In his 35 year career, he has done work for Stanford University, National Semiconductor, Advanced Micro Devices, numerous startup companies in the Silicon Valley.

Please note:
- Since the west side entrance to the Red Cross Building is always locked, we recommend entering the Red Cross Building through the main entrance situated on the north side of the building.
- The Red Cross locks the main entrance at 7pm sharp, so please come early in order to get access to the building.
- We will be in Meeting Room 3 -- about 100 feet from any entrance. As a result, late comers who knock on an outside door won't be heard from our meeting room. If you need help getting in the door, you can my cellphone: 408-636-6172.
- The meeting will be in-person only and not streamed via Zoom.

By the way, several of us meet nearby for dinner prior to the meeting at 5:30pm at Dish-N-Dash (2551 N. 1st St., San Jose), https://dishdash.com. Feel free to join us.

73s,
Jim, K6EI
WVARA Vice President

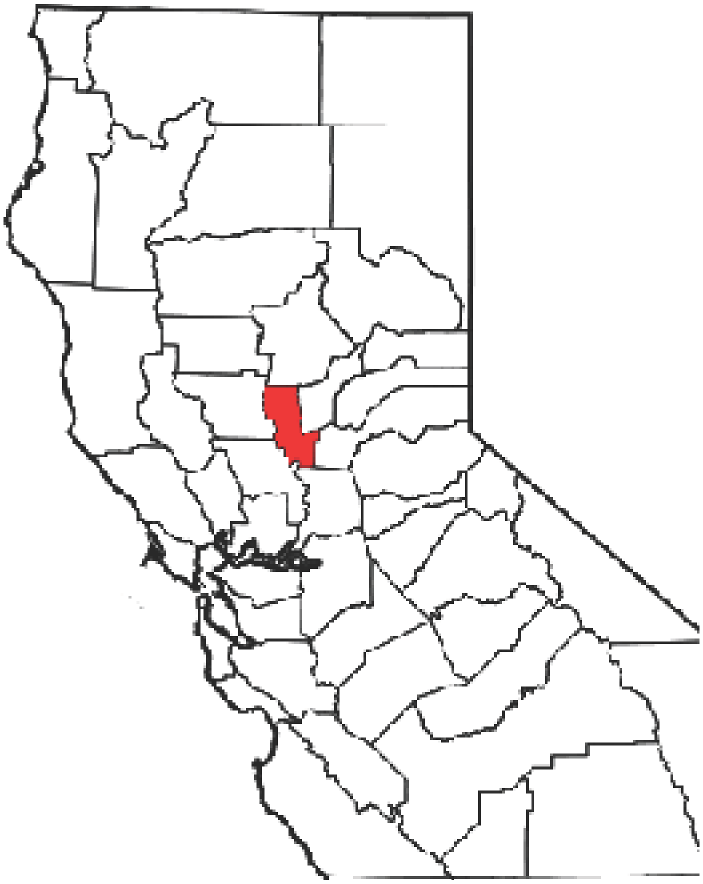
WVARA Holiday BBQ
When: 11am – 1pm, Saturday, Dec 16
Where: Silicon Valley Red Cross Building Patio on the east-facing side of the facility. We can shift indoors to Room 3 if it rains. The Red Cross building is at 2731 N. FirstStreet at Plumeria Drive (southwest corner) in San Jose.

There won't be an evening WVARA meeting in December. Instead, we are having aHoliday BBQ. We'll have hot charcoal and condiments — please bring your ownmeat to grill, and maybe a desert or side dish to share. And of course, the WVARA tradition of a Holiday Raffle is good to go. Santa Clausis making arrangements for some great door prizes. So be there or be square!
– Jim, K6EI

California QSO Party: A Small-scale Expedition to Sutter County

The California QSO Party (CQP) occurs each year during the first weekend in October when hamsacross the country (and the globe) try to contact all 58 California counties. Some years, CQP is anopportunity for me to pursue a big score and maybe a chance at getting a plaque to hang on the wall inthe shack. This year was not destined to be one of those years. But that didn't stop some of me fromhaving a lot of fun.

In a typical year, Tom Dunbar (W6ESL) and I assist Bob Olson (W6BO) in the activation of his multi-to Bob owns 10 acres, an impressive antenna farm, and plenty of space for additionaltemporary antennas. But a phone call from Bob three weeks prior to this year's contest brought newsthat he would be out-of-state during CQP weekend and his station would not operationally ready. SoTom and I needed to quickly come up with a Plan B.



Tom and I were already committed to activating Sutter County – a fairly rare multiplier – and so with theM/M option off the table, a small-scale county expedition was the obvious way to go. Sutter is asparsely-populated county consisting of rice fields with more water fowl than people. A quick Google search revealed that there were no camping options to be found anywhere in the county.

Given that it was now mid-September, housing options available through AirBnB and VRBO were rapidly dwindling. So after a thorough review of the options, we selected to rent a house on a small lot in Yuba City – Sutter County's biggest town. The location wasn't ideal from an RF standpoint (limited space for antennas, nearby power lines, etc), but this was the best choice available under the circumstances.

Our solution was to install a half dozen simple, low-profile antennas that would enable us to run twotransmitters (Tom on SSB and me on CW) on 10- through 80-meters. Having never been to thislocation before, we relied on GoogleMap's overhead view feature to provide us with a preview ofthe property's layout as well as the location of nearby power lines.

The next step was to come up with a plan regarding antennas. The AirBnB house had asmall backyard and an even smaller front yard. And being a rental, we didn't want to install any crazyantenna structures that would upset our host. So we came up with four basic multiband antennasthat could fit on the available property:

1. Hygain 14AVQ Trap ¼ wave vertical (covering 10/15/20/40) with twenty radials
2. Rotatable trap dipole (covering 10/15/20) up 20 feet
3. End-fed dipole (covering 10/15/20/40) supported by 30ft fiberglass mast so that half the antennawas vertical and the other half extended from the top of the mast
4. Buckmaster Off-Center-Fed (OCF) Dipole (covering 10/20/40/80) with its feed-point supported by a30ft steel pushup mast.

At a previous Winter Field Day I had encountered significant receive noise when using this OCFdipole. Reviewing available documentation, I found that this antenna uses a voltage balun instead of acurrent balun. Voltage baluns try to force the output terminals to equal voltages and can sometimesintroduce phase shift between each output terminal and ground. (Voltage baluns are notorious forintroducing common-mode current on the outer surface of the coax's braid which can cause thefeedline to pick up local electrical noise.) As a result, I added an external 1:1 current balun at thefeedpoint whenever as shown above for the CQP installation.

We completed the installation on Friday afternoon (with an outdoor temperature 105 degrees) and setup our two stations in the dining room and living room, using Comet CTC-50M window feed-throughjumpers to get each of the feedlines We had a 10/15/20 triplexer which we could use to share any ofour antennas between our two stations as needed, and as well as individual bandpass filters to reduceunwanted harmonics when using separate antennas.

Friday evening was spent debugging our installation. Murphy immediately made his presenceknown with significant RFI on 15 meters from the 14AVQ trap vertical that locked-up my logging PC. Ihad placed an RF choke at the feedpoint of the vertical, but the feedline lay on the ground adjacent tothe radials which were inducing common-mode current on the exterior of the coaxial cable's braid. Thesimple solution was to add a second RF choke where the feedline from the trap vertical entered thehouse. This completely solved the problem. Important lesson: always bring extra ferrite toroids!

On receive, the observed noise levels with each of the four Transmission tests Friday evening usingthe Reverse Beacon Network showed that on 20- and 40-meters, the OCF Dipole (with its legsextending east/west) was superior for West Coast contacts, while East Coast signal reports associatedwith the rotatable 10/15/20 dipole, EF dipole, and trap vertical were all about equivalent.

The Contest Begins . . . . .

Given schedule constraints, we had decided to operate in the One-Day Expedition Category –focusing our 12-hours of radio time on Saturday. A week or so prior to the contest, Gina Salazar(KN6ZMT) had posted on the WVARA Chat Reflector that she was interested in participating in aCQP operation. Gina had passed her licensing exam a few months before, and was interested inseeing what SSB contesting was all about. Tom and I figured that our small-scale expedition was aperfect venue to introduce a new ham to the fun of contesting, and so we let Gina know that shewas welcome to come help us out in Yuba City. Sure enough, that Saturday morning Gina and herchihuahua arrived at our QTH, and Tom immediately put her on the air handing out Sutter Countymultipliers. While the two of them ran the SSB station (using a thirty year old Kenwood transceiver),

I kept busy running CW QSOs with my Elecraft K3S.

As the contest progressed, it became clear that the local noise level was going to be a bit of achallenge. We were running low power (100 watts) but even so, frequently found ourselves beingcalled by stations that we couldn't copy. Because we were traveling light, both of our stationswere using switching power supplies (with ferrites on the DC lines), and some of our RFI issues wereundoubtedly from those. Being adjacent to overhead power lines didn't help either.

The other obvious noise source was the home's air conditioner. When the AC was running, the noiselevel from the trap vertical (located about 15 feet from the air conditioner), would jump about 10db. The simple solution was to only run the AC when we didn't need the trap vertical.

Because we were using multiband antennas that could easilyndpass filters t This, of course, resultedin additional loss. Previous testing of all of our band pass filters had indicated anywhere between 0.6and 1.2 dB of insertion loss. And whichever Dunestar filter was in use during the contest becamephysically warm after a few minutes of CQing. In an ideal setting, we would have deployed a set of monoband antennas with plenty of physical isolation so that bandpass filters would not be needed. (Or else higher quality filters with less insertion loss.) But for our small-scale operation, we settled for the non-ideal.

In spite of our site's limitations, CQP was a real hoot. Ours was the only callsign active from Sutter County on Saturday, and the excitement of some of the operators who worked us was palpable. Inever got tired of listening to pile-ups when multiple stations competed to get my response. And on at least four occasions, we were told that our contact was the final county enabling a non-California CQPer a clean-sweep of all 58 counties.

By the time we pulled the plug Saturday evening after our 12-hours on the air, we had completed almost 500 contacts and had worked all 58 multipliers for a final score of not quite 100,000. While thiswasn't a big score, we were pleased that we had been able to provide a rare county multiplier to somany out-of-state CQP participants.

WVARA Net Check-Ins (W6PIY)
Tuesdays at 8:30 PM

Date		10/10/23	10/17/23	10/24/23	10/31/23
TOTAL		15	16	13	11
AF6AE	Bill	X	X	X	
WB6KHP	Dave	X	X	X	X
KX6B	Dick	X	X	X	X
KN6WFM	Drew	X	X	X	
KN6ZMT	Gina	X	X	X	X
AJ6LG	Jeff	X	X	X	X
K6EI	Jim		X		
KK6VF	Kevin	NET	NET	NET	NET
W6IA	Mark		X	X	
WB6JMR	Mark		X		
W6BG	Max		X		X
W6PK	Phil	X			
W8RJL	Ron	X		X	
KK6HPF	Ross	X	X	X	X
KC6ZKT	Steve	X			X
WB6JHI	Steve	X	X	X	X
KF6EMB	Svend	X	X	X	X
KN6FGH	Tim	X	X	X	X
KB6NTW	Vince	X	X		

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